What is claimed is:

1. A method of modeling a plan, comprising the steps of:

defining a planning process cycle decision variable $X_{(p, T)}$ to represent an amount of a process p used during a time bucket T;

defining an energy per cycle variable $EPC_{(p, r)}$ to represent an amount of energy of a resource used by the process p;

defining a maximum energy $E_{max(r, T)}$ variable to represent a maximum energy of the resource r that can be used during a single time bucket T, and

maintaining a constraint on a product of the $X_{(p, T)}$ variable and the $EPC_{(p, r)}$ variable, summed over the process p, to be less than or equal to $E_{max(r, T)}$.

2. The method of Claim 1, wherein the energy per cycle variable $EPC_{(p, r)}$ is constant for a given process p and resource r.

3. The method of Claim 1, wherein the process p produces or consumes items i and wherein a product of $X_{(p, T)}$ and a quantity of items i produced or consumed by process p is equal to a quantity of item i produced or consumed by process p during time bucket T.

4. A method of modeling a schedule, comprising the steps of:

defining a scheduling process cycle decision variable X_a to represent an amount of cycles used by an activity a;

defining an energy per cycle variable $EPC_{p(a), r}$ to represent an amount of energy per cycle expended by a process p used by the activity a of a resource r;

defining an energy $E_{a, r}$ variable to represent the energy that the activity a uses of the resource r, and

maintaining equality of the $E_{a, r}$ variable and a product of the X_a variable and the $EPC_{p(a), r}$ variable for all resource r.

5. The method of Claim 4, wherein the energy per cycle variable $EPC_{p(a), r}$ is constant for the activity a used the process p and resource r.

6. The method of Claim 1, wherein the process p used by activity a produces or consumes items i and wherein a product of X_a and a quantity of items i produced or consumed per cycle by the process p used by the activity a is equal to a quantity of item i produced or consumed by process p used by activity a.

7. A method of communicating between a plan and a schedule, comprising the steps of:

modeling the plan by defining a planning process cycle decision variable $X_{(p, T)}$ to represent an amount of a process p used during a time bucket T such that a product of an energy per cycle variable $EPC_{(p, r)}$ representing an amount of energy of a resource used by the process p and the $X_{(p, T)}$ variable, summed over the process p, is less than or equal to a maximum energy $E_{max(r, T)}$ variable that represents a maximum energy of the resource r that can be used during a single time bucket T;

modeling the schedule by defining a scheduling process cycle decision variable X_a to represent an amount of cycles used by an activity a such that a product of an energy per cycle variable $EPC_{p(a), r}$ representing an amount of energy per cycle expended by a process p used by the activity a of a resource r, over all resource r, is equal to an energy $E_{a, r}$ variable that represents the energy that the activity a uses of the resource r, and

attempting to maintain equality between values of $X_{(p, T)}$ and values of X_a that occur during a time bucket T, summed across all time buckets T and across all activities a that use the process p.

8. The method of Claim 7, wherein a value of X_a that occurs during the time bucket T is a product of X_a and $\underline{d(T \cap a)}$ / d(a).

9. The method of Claim 7, wherein $X^0_{(p, T)}$ represents a recommendation from the planning model and $X^A_{(p, T)}$ represents a contribution to $X_{(p, T)}$ of a set A of activities scheduled so far and wherein the method further comprises a step of selecting a next process p to schedule based upon the recommendation $X^0_{(p, T)}$, the selected next process p maximizing a difference between a value of the $X^0_{(p, T)}$ variable and a value of the $X^A_{(p, T)}$ variable.

10. The method of Claim 7, wherein $X^0_{(p, T)}$ represents a recommendation from the planning model, $X^A_{(p, T)}$ represents a contribution to $X_{(p, T)}$ of a set A of activities scheduled so far, slack variable $X^R_{(p, T)}$ is defined as a difference between $X^0_{(p, T)}$ and $X^A_{(p, T)}$, and $X^R_{(p, T)}(K)$ is a sum of the slack variables $X^R_{(p, T)}$ over a number K of time buckets, and wherein a next process to schedule is selected so as to minimize a number K(p) that is defined such that $X^R_{(p, T)}(K - 1) \leq Q_{(i, t)} / QPC_{(p, i)} \leq X^R_{(p, T)}(K)$ is true.

11. The method of Claim 7, wherein $X^0_{(p, T)}$ represents a recommendation from the planning model, and wherein a next activity a that uses process p is selected by attempting to schedule each process p and independently scheduling activity a that corresponds to the attempted scheduled process p and by selecting the attempted scheduled process p or activity a that that does not exceed $X^0_{(p, T)}$ and has a minimum duration.

12. The method of Claim 7, wherein $X^0_{(p, T)}$ represents a recommendation from the planning model and wherein the method further comprises a step of updating $X^0_{(p, T)}$ to obtain $X^{new}_{(p, T)}$ and using $X^{new}_{(p, T)}$ instead of $X^0_{(p, T)}$ when $X^A_{(p, T)} > X^0_{(p, T)}$ for some (p, T).

13. The method of Claim 12, wherein $X^A_{(p, T)}$ represents a contribution to $X_{(p, T)}$ of a set A of activities scheduled so far and wherein the plan modeling step is carried out with an additional constraint of a defined upper bound of $X_{(p, T)} > X^A_{(p, T)}$.

14. The method of Claim 13, wherein if at any point $X^A_{(p, T)} \geq X^0_{(p, T)}$, the method includes carrying out:

a backtracking step wherein a last process p in the schedule is unscheduled until $X^0_{(p, T)} \geq X^A_{(p, T)}$, or

an updating step to update $X^0_{(p, T)}$ to obtain $X^{new}_{(p, T)}$ and to determine whether $X^{new}_{(p, T)} \geq X^A_{(p, T)}$ holds true.

15. A computer system configured for modeling a plan, comprising:

at least one processor;

at least one data storage device;

a plurality of processes spawned by said at least one processor, the processes including processing logic for:

defining a planning process cycle decision variable $X_{(p, T)}$ to represent an amount of a process p used during a time bucket T;

defining an energy per cycle variable $EPC_{(p, r)}$ to represent an amount of energy of a resource used by the process p;

defining a maximum energy $E_{max(r, T)}$ variable to represent a maximum energy of the resource r that can be used during a single time bucket T, and

maintaining a constraint on a product of the $X_{(p, T)}$ variable and the $EPC_{(p, r)}$ variable, summed over the process p, to be less than or equal to $E_{max(r, T)}$.

16. The computer system of Claim 15, wherein, the energy per cycle variable $EPC_{(p, r)}$ is constant for a given process p and resource r.

17. The computer system of Claim 15, wherein the process p produces or consumes items i and wherein a product of $X_{(p, T)}$ and a quantity of items i produced or consumed by process p is equal to a quantity of item i produced or consumed by process p during time bucket T.

18. A computer system configured for modeling a schedule, comprising:

at least one processor;

at least one data storage device;

a plurality of processes spawned by said at least one processor, the processes including processing logic for:

defining a scheduling process cycle decision variable X_a to represent an amount of cycles used by an activity a;

defining an energy per cycle variable $EPC_{p(a), r}$ to represent an amount of energy per cycle expended by a process p used by the activity a of a resource r;

defining an energy $E_{a, r}$ variable to represent the energy that the activity a uses of the resource r, and

maintaining equality of the $E_{a, r}$ variable and a product of the X_a variable and the $EPC_{p(a), r}$ variable for all resource r.

19. The computer system of Claim 18, wherein, the energy per cycle variable $EPC_{p(a), r}$ is constant for the activity a used the process p and resource r.

20. The computer system of Claim 18, wherein the process p used by activity a produces or consumes items i and wherein a product of X_a and a quantity of items i produced or consumed per cycle by the process p used by the activity a is equal to a quantity of item i produced or consumed by process p used by activity a.

21. A computer system configured for communicating between a plan and a schedule, comprising:

at least one processor;

at least one data storage device;

a plurality of processes spawned by said at least one processor, the processes including processing logic for:

modeling the plan by defining a planning process cycle decision variable $X_{(p, T)}$ to represent an amount of a process p used during a time bucket T such that a product of an energy per cycle variable $EPC_{(p, r)}$ representing an amount of energy of a resource used by the process p and the $X_{(p, T)}$ variable, summed over the process p, is less than or equal to a maximum energy $E_{max(r, T)}$ variable that represents a maximum energy of the resource r that can be used during a single time bucket T;

modeling the schedule by defining a scheduling process cycle decision variable X_a to represent an amount of cycles used by an activity a such that a product of an energy per cycle variable $EPC_{p(a), r}$ representing an amount of energy per cycle expended by a process p used by the activity a of a resource r, over all resource r, is equal to an energy $E_{a, r}$ variable that represents the energy that the activity a uses of the resource r, and

attempting to maintain equality between a value of $X_{(p, T)}$ and a value of X_a that occurs during a time bucket T, summed across all time buckets T and across all activities a that use the process p.

22. The computer system of Claim 21, wherein a value of X_a that occurs during the time bucket T is a product of X_a and $\underline{d(T \cap a)}$ / d(a).

23. The computer system of Claim 21, wherein $X^0_{(p, T)}$ represents a recommendation from the planning model and $X^A_{(p, T)}$ represents a contribution to $X_{(p, T)}$ of a set A of activities scheduled so far and wherein the computer systems is configured to select a next process p to schedule based upon the recommendation $X^0_{(p, T)}$, the selected next process p maximizing a difference between a value of the $X^0_{(p, T)}$ variable and a value of the $X^A_{(p, T)}$ variable.

24. The computer system of Claim 21, wherein $X^0_{(p, T)}$ represents a recommendation from the planning model, $X^A_{(p, T)}$ represents a contribution to $X_{(p, T)}$ of a set A of activities scheduled so far, slack variable $X^R_{(p, T)}$ is defined as a difference between $X^0_{(p, T)}$ and $X^A_{(p, T)}$, and $X^R_{(p, T)}(K)$ is a sum of the slack variables $X^R_{(p, T)}$ over a number K of time buckets, and wherein the computer system is configured to schedule a next process p so as to minimize a number K(p) that is defined such that $X^R_{(p, T)}(K - 1) \leq Q_{(i, t)} / QPC_{(p, i)} \leq X^R_{(p, T)}(K)$ is true.

25. The computer system of Claim 21, wherein $X^0_{(p, T)}$ represents a recommendation from the planning model, and wherein the computer system is configured to select a next activity a that uses process p by attempting to schedule each process p and independently scheduling activity a that corresponds to the attempted scheduled process p

and by selecting the attempted scheduled process p or activity a that that does not exceed $X^0_{(p, T)}$ and has a minimum duration.

26. The computer system of Claim 21, wherein $X^0_{(p, T)}$ represents a recommendation from the planning model and wherein the computer system is further configured to carry out a step of updating $X^0_{(p, T)}$ to obtain $X^{new}_{(p, T)}$ and using $X^{new}_{(p, T)}$ instead of $X^0_{(p, T)}$ when $X^A_{(p, T)} > X^0_{(p, T)}$ for some (p, T).

27. The computer system of Claim 26, wherein $X^A_{(p, T)}$ represents a contribution to $X_{(p, T)}$ of a set A of activities scheduled so far and wherein the plan modeling step is carried out with an additional constraint of a defined upper bound of $X_{(p, T)} > X^A_{(p, T)}$.

28. The computer system of Claim 27, wherein if at any point $X^A_{(p, T)} \geq X^0_{(p, T)}$, the computer system carries out:

a backtracking step wherein a last process p in the schedule is unscheduled until $X^0_{(p, T)} \geq X^A_{(p, T)}$, or

an updating step to update $X^0_{(p, T)}$ to obtain $X^{new}_{(p, T)}$ and to determine whether $X^{new}_{(p, T)} \geq X^A_{(p, T)}$ holds true.

29. A machine-readable medium having data stored thereon representing sequences of instructions which, when executed by computing device, causes said computing device to model a plan by performing the steps of:

defining a planning process cycle decision variable $X_{(p, T)}$ to represent an amount of a process p used during a time bucket T;

defining an energy per cycle variable $EPC_{(p, r)}$ to represent an amount of energy of a resource used by the process p;

defining a maximum energy $E_{max(r, T)}$ variable to represent a maximum energy of the resource r that can be used during a single time bucket T, and

maintaining a constraint on a product of the $X_{(p, T)}$ variable and the $EPC_{(p, r)}$ variable, summed over the process p, to be less than or equal to $E_{max(r, T)}$.

30. The medium of Claim 29, wherein, the energy per cycle variable $EPC_{(p, r)}$ is constant for a given process p and resource r.

31. The medium of Claim 29, wherein the process p produces or consumes items i and wherein a product of $X_{(p, T)}$ and a quantity of items i produced or consumed by process p is equal to a quantity of item i produced or consumed by process p during time bucket T.

32. A machine-readable medium having data stored thereon representing sequences of instructions which, when executed by computing device, causes said computing device to model a schedule by performing the steps of:

defining a scheduling process cycle decision variable X_a to represent an amount of cycles used by an activity a;

defining an energy per cycle variable $EPC_{p(a), r}$ to represent an amount of energy per cycle expended by a process p used by the activity a of a resource r;

defining an energy $E_{a, r}$ variable to represent the energy that the activity a uses of the resource r, and

maintaining equality of the $E_{a, r}$ variable and a product of the X_a variable and the $EPC_{p(a), r}$ variable for all resource r.

33. The medium of Claim 32, wherein, the energy per cycle variable $EPC_{p(a), r}$ is constant for the activity a used the process p and resource r.

34. The method of Claim 32, wherein the process p used by activity a produces or consumes items i and wherein a product of X_a and a quantity of items i produced or consumed per cycle by the process p used by the activity a is equal to a quantity of item i produced or consumed by process p used by activity a.

35. A machine-readable medium having data stored thereon representing sequences of instructions which, when executed by computing device, causes said computing device to communicate between a plan and a schedule by performing the steps of:

modeling the plan by defining a planning process cycle decision variable $X_{(p, T)}$ to represent an amount of a process p used during a time bucket T such that a product of an energy per cycle variable $EPC_{(p, r)}$ representing an amount of energy of a resource used by the process p and the $X_{(p, T)}$ variable, summed over the process p, is less than or equal to a maximum energy $E_{max(r, T)}$ variable that represents a maximum energy of the resource r that can be used during a single time bucket T;

modeling the schedule by defining a scheduling process cycle decision variable X_a to represent an amount of cycles used by an activity a such that a product of an energy per cycle variable $EPC_{p(a), r}$ representing an amount of energy per cycle expended by a process p used by the activity a of a resource r, over all resource r, is equal to an energy $E_{a, r}$ variable that represents the energy that the activity a uses of the resource r, and

attempting to maintain equality between a value of $X_{(p, T)}$ and a value of X_a that occurs during a time bucket T, summed across all time buckets T and across all activities a that use the process p.

36. The medium of Claim 35, wherein a value of X_a that occurs during the time bucket T is a product of X_a and $\underline{d(T \cap a)}$ / d(a).

37. The medium of Claim 35, wherein $X^0_{(p, T)}$ represents a recommendation from the planning model and $X^A_{(p, T)}$ represents a contribution to $X_{(p, T)}$ of a set A of activities scheduled so far and wherein the medium is configured to cause the computing device to carry out a step of selecting a next process p to schedule based upon the recommendation $X^0_{(p, T)}$, the selected next process p maximizing a difference between a value of the $X^0_{(p, T)}$ variable and a value of the $X^A_{(p, T)}$ variable.

38. The medium of Claim 35, wherein $X^0_{(p, T)}$ represents a recommendation from the planning model, $X^A_{(p, T)}$ represents a contribution to $X_{(p, T)}$ of a set A of activities scheduled so far, slack variable $X^R_{(p, T)}$ is defined as a difference between $X^0_{(p, T)}$ and $X^A_{(p, T)}$, and $X^R_{(p, T)}(K)$ is a sum of the slack variables $X^R_{(p, T)}$ over a number K of time buckets, and wherein the medium is configured to cause the computing device to select a next process to schedule so as to minimize a number K(p) that is defined such that $X^R_{(p, T)}(K - 1) \leq Q_{(i, t)} / QPC_{(p, i)} \leq X^R_{(p, T)}(K)$ is true.

39. The medium of Claim 35, wherein $X^0_{(p, T)}$ represents a recommendation from the planning model, and wherein the medium is configured to cause the computing device to carry out a step of selecting a next activity a that uses process p by attempting to schedule each process p and independently scheduling activity a that corresponds to the attempted scheduled process p and by selecting the attempted scheduled process p or activity a that that does not exceed $X^0_{(p, T)}$ and has a minimum duration.

40. The method of Claim 35, wherein $X^0_{(p, T)}$ represents a recommendation from the planning model and wherein the medium is configured to cause the computing device to

carry out a step of updating $X^0_{(p, T)}$ to obtain $X^{new}_{(p, T)}$ and to use $X^{new}_{(p, T)}$ instead of $X^0_{(p, T)}$ when $X^A_{(p, T)} > X^0_{(p, T)}$ for some (p, T).

41. The method of Claim 40, wherein $X^A_{(p, T)}$ represents a contribution to $X_{(p, T)}$ of a set A of activities scheduled so far and wherein the plan modeling step is carried out with an additional constraint of a defined upper bound of $X_{(p, T)} > X^A_{(p, T)}$.

42. The medium of Claim 41, wherein if at any point $X^A_{(p, T)} \geq X^0_{(p, T)}$, the medium is configured to cause the computing device to carry out:

a backtracking step wherein a last process p in the schedule is unscheduled until $X^0_{(p, T)} \geq X^A_{(p, T)}$, or

an updating step to update $X^0_{(p, T)}$ to obtain $X^{new}_{(p, T)}$ and to determine whether $X^{new}_{(p, T)} \geq X^A_{(p, T)}$ holds true.